## **IN THE CLAIMS:**

Please amend the claims as follows:

Claims 1-31 (Cancelled)

- 32. (New) An isolated and purified nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO: 13.
- 33. (New) The nucleic acid molecule according to claim 32 wherein the molecules are from about 10 to 20 nucleotides in length.
- 34. (New) A composition consisting essentially of an isolated nucleic acid molecule consisting essentially of the nucleotide sequence of SEQ ID NO: 13.
- 35. (New) The composition of claim 34, further comprising one or more nucleic acid molecules comprising the nucleotide sequence of any one of SEQ ID NO: 1 to 12 or 14 to 68.
- 36. (New) The composition according to claim 34 or 35 wherein the molecules are between about 10 and 20 nucleotides in length.
- 37. (New) A primer comprising a nucleotide sequence corresponding to the nucleotide sequence from position 586 to 606 or position 791 to 810 of SEQ ID NO: 13.
  - 38. (New) A composition comprising the primer according to claim 37.
- 39. (New) A composition comprising the primer according to claim 37, and further comprising one or more primers comprising a nucleotide sequence corresponding to any of primer 1 or primer 2 in the table below:

SEQ ID NO:	H specificity	Positions of	Positions of
		primer 1	primer 2
66	1	892-909	1172-1189
67	2	568-587	1039-1056
6, 17, 42	4	466-483	628-648
7	5	697-714	877-897
8	6	565-585	799-816
9	7	553-570	1483-1500
11	9	616-633	838-855
12 (49)	10	559-579	697-717
14	12	892-909	1172-1189
15	14	586-606	793-813
16	15	640-660	817-834
68	16	649-666	925-942
18	18	589-606	802-819
17	19	607-624	538-855
20	20	574-591	760-780
21, 46	21	676-693	862-879
22	23	637-654	1336-1353
23	24	496-515	772-792
25	26	553-570	772-789
26	27.	685-702	799-819
27	28	592-609	778-798
28	29	538-555	757-774
29	30	814-831	943-962
30	31	571-588	790-807
31	32	514-831	1057-1074
32	33	553-570	718-735
33	34	568-585	796-816
36, 53	38	553-573	709-729
37	39	556-573	718-735
39	41	598-615	784-801
40	42	547-567	715-735
41	43	580-597	844-861

43	45	640-657	943-963
44	46	565-582	781-801
48	49	589-609	754-771
50	51	565-582	1042-1059
51	52	598-615	829-846
54	56	697-714	877-897
10 and 38		562-579	1045-1062
24		<u>529-549</u>	703-723
34		769-789	1045-1065
35		520-537	715-735
47		568-585	835-852
52		988-1008	1344-1364

- 40. (New) A method of detecting the H serotype of *E. coli* in a sample, the method comprising the following steps:
- (a) contacting a gene of an *E. coli* in the sample with a nucleic acid molecule according to claim 1, in conditions sufficient to allow the nucleic acid molecule to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence; and
- (b) detecting whether the nucleic acid molecule is hybridised to the gene, to detect the H serotype of the *E. coli* in the sample.
- 41. (New) A method of detecting the H serotype of *E. coli* in a sample, the method comprising the following steps:
- (a) contacting a gene of an *E. coli* in the sample with a nucleic acid molecule according to claim 1 and one or more nucleic acid molecules comprising a nucleotide sequence of any one of SEQ ID NO: 1 to 12 or 14 to 44 or 46 to 55 or 57 to 68 or a part thereof, in conditions sufficient to allow at least one of the nucleic acid molecules to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence; and
- (b) detecting whether one or more of the at least one nucleic acid molecules is hybridised to the gene, to detect the H serotype of the *E. coli* in the sample.

- 42. (New) A method according to claim 40 or 41 wherein the hybridised nucleic acid molecules are detected by Southern Blot analysis.
- 43. (New) A method of detecting the H serotype of *E. coli* in a sample, the method comprising the following steps:
- (a) contacting a gene of an *E. coli* in the sample with a pair of nucleic acid molecules according to claim 1, in conditions sufficient to allow the pair of nucleic acid molecules to hybridise to a nucleic acid molecule with a complementary nucleic acid sequence; and
- (b) detecting whether the pair of nucleic acid molecules is hybridised to the gene, to detect the H serotype of the *E. coli* in the sample.
- 44. (New) A method of detecting the H serotype of *E. coli* in a sample, the method comprising the following steps:
- (a) contacting a gene of an *E. coli* in the sample with a pair of nucleic acid molecules according to claim 1 and one or more pairs of nucleic acid molecules comprising a nucleic acid sequence of all or part of any one of SEQ ID NO: 1 to 12 or 14 to 44 or 46 to 55 or 57 to 68 or a part thereof, in conditions sufficient to allow at least one pair of nucleic acid molecules to hybridise to a nucleic acid molecule with a complementary nucleic acid sequence; and
- (b) detecting whether one or more of the at least one pairs of nucleic acid molecules is hybridised to the gene, to detect the H serotype of the *E. coli* in the sample.
- 45. (New) A method according to claim 43 or 44 wherein the hybridised pair of nucleic acid molecules are detected by the polymerase chain reaction.
- 46. (New) A method for detecting the H and 0 serotype of *E. coli* sample, the method comprising the following steps:
- (a) contacting a gene of the *E. coli* with a nucleic acid molecule selected from the group consisting of:

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wbdH (nucleotide position 739 to 1932 of SEQ ID NO:45, wzx (nucleotide position 8646 to 9911 of SEQ ID NO:45, wzy (nucleotide position 9901 to 10953 of SEQ ID NO:45, wbdM (nucleotide position 11821 to 12945 of SEQ ID NO:45, wbdN (nucleotide position 79 to 861 of SEQ ID NO:56), wbdO (nucleotide position 2011 to 2757 of SEQ ID NO:56), wbdP (nucleotide position 5257 to 6471 of SEQ ID NO:56), wbdR (nucleotide position 13156 to 13821 of SEQ ID NO:56), wzx (nucleotide position 2744 to 4135 of SEQ ID NO:56) and wzy (nucleotide position 858 to 2042 of SEQ ID NO:56),
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in conditions sufficient to allow the nucleic acid molecule to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence;

- (b) contacting a gene of an *E. coli* in the sample with a nucleic acid molecule according to claim 1, in conditions sufficient to allow the nucleic acid molecule to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence; and
- (c) detecting whether the nucleic acid molecules are hybridised to the genes, to detect the H and 0 serotype of the *E. coli* in the sample.
- 47. (New) A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:
- (a) contacting a gene of the *E. coli* with a nucleic acid molecule selected from the group consisting of:

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wbdH (nucleotide position 739 to 1932 of SEQ ID NO:45, wzx (nucleotide position 8646 to 9911 of SEQ ID NO:45, wzy (nucleotide position 9901 to 10953 of SEQ ID NO:45, wbdM (nucleotide position 11821 to 12945 of SEQ ID NO:45, wbdN (nucleotide position 79 to 861 of SEQ ID NO:56), wbdO (nucleotide position 2011 to 2757 of SEQ ID NO:56), wbdP (nucleotide position 5257 to 6471 of SEQ ID NO:56),
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wbdR (nucleotide position 13156 to 13821 of SEQ ID NO:56), wzx (nucleotide position 2744 to 4135 of SEQ ID NO:56) and wzy (nucleotide position 858 to 2042 of SEQ ID NO:56),

in conditions sufficient to allow the nucleic acid molecule to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence;

- (b) contacting a gene of an *E. coli* in the sample with a nucleic acid molecule according to claim 1, in conditions sufficient to allow the nucleic acid molecule and one or more nucleic acid molecules comprising a nucleotide sequence of any one of SEQ ID NO: 1 to 12 or 14 to 44 or 46 to 55 or 57 to 68 or a part thereof, in conditions sufficient to allow at least one of the nucleic acid molecules to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence; and
- (c) detecting whether the nucleic acid molecules are hybridised to the genes, to detect the H and O serotype of the *E. coli* in the sample.
- 48. (New) A method according to claim 46 or 47 wherein the nucleic acid molecule of step (a) is a forward primer or a reverse primer selected from the group of

Forward primer (base position of SEQ	Reverse Primer (base position of SEQ
ID NO:1)	ID NO:1)
739-757	1941-1924
925-942	1731-1714
925-942	1347-1330
1165-1182	<u>1731-1714</u>
8646-8663	9908-9891
8906-8923	9468-9451
9150-9167	<u>9754-9737</u>
<u>9976-9996</u>	10827-10807
10113-10130	10484-10467
10931-10949	<u>11824-11796</u>
11821-11844	12945-12924

12042-12059	12447-12430
12258-12275	12698-12681

Forward Primer (base position of SEQ	Reverse Primer (base position of SEQ
ID NO:2)	ID NO:2)
79-96	861-844
184-201	531-514
310-327	768-751
858-875	<u>2042-2025</u>
1053-1070	1619-1602
1278-1295	1913-1896
2011-2028	2757-2740
2110-2127	2493-2476
2305-2322	2682-2665
2744-2761	4135-4118
<u>2942-2959</u>	3628-3611
5257-5274	6471-6454
5440-5457	5973-5956
5707-5724	6231-6214
13261-13278	13629-13612
13384-13401	13731-13714

- 49. (New) A method according to claim 46 or 47 wherein the hybridised nucleic acid molecules are detected by Southern Blot analysis.
- 50. (New) A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:
- (a) contacting a gene of the E. coli with a pair of nucleic acid molecules selected from the group consisting of :

wbdH (nucleotide position 739 to 1932 of SEQ ID NO:45, wzx (nucleotide position 8646 to 9911 of SEQ ID NO:45,

wzy (nucleotide position 9901 to 10953 of SEQ ID NO:45, wbdM {nucleotide position 11821 to 12945 of SEQ ID NO:45, wbdN (nucleotide position 79 to 861 of SEQ ID NO:56), wbdO (nucleotide position 2011 to 2757 of SEQ ID NO:56), wbdP (nucleotide position 5257 to 6471 of SEQ ID NO:56), wbdR (nucleotide position 13156 to 13821 of SEQ ID NO:56), wzx (nucleotide position 2744 to 4135 of SEQ ID NO:56) and wxy (nucleotide position 858 to 2042 of SEQ ID NO:56)

in conditions sufficient to allow the pair of nucleic acid molecules to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence;

- (b) contacting a gene of an *E. coli* in the sample with a pair of nucleic acid molecules according to claim 1, in conditions sufficient to allow the pair of nucleic acid molecules to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence; and
- (c) detecting whether the pairs of nucleic acid molecules are hybridised to the genes, to detect the H and O serotype of the *E. coli* in the sample.
- 51. (New) A method for detecting the H and O serotype of E. coli in a sample, the method comprising the following steps:
- (a) contacting a gene of the *E. coli* with a pair of nucleic acid molecules selected from the group consisting of:

wbdH (nucleotide position 739 to 1932 of SEQ ID NO:45, wzx (nucleotide position 8646 to 9911 of SEQ ID NO:45, wzy (nucleotide position 9901 to 10953 of SEQ ID NO:45, wbdM (nucleotide position 11821 to 12945 of SEQ ID NO:45, wbdN (nucleotide position 79 to 861 of SEQ ID NO:56), wbdO (nucleotide position 2011 to 2757 of SEQ ID NO:56), wbdP (nucleotide position 5257 to 6471 of SEQ ID NO:56), wbdR (nucleotide position 13156 to 13821 of SEQ ID NO:56),

wzx (nucleotide position 2744 to 4135 of SEQ ID N0:56) and wxy (nucleotide position 858 to 2042 of SEQ ID NO:56)

in conditions sufficient to allow the pair of nucleic acid molecules to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence;

- (b) contacting a gene of an *E. coli* in the sample with a pair of nucleic acid molecules according to claim 1 and one or more pairs of nucleic acid molecules comprising a sequence of any one of SEQ ID NO: 1 to 12 or 14 to 44 or 46 to 55 or 57 to 68 or a part thereof, in conditions sufficient to allow at least one pair of nucleic acid molecules to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence; and
- (c) detecting whether the pairs of nucleic acid molecules are hybridised to the genes, to detect the H and 0 serotype of the *E. coli* in the sample.
- 52. (New) A method according to claim 50 or 51 wherein the nucleic acid molecules of the pair of step (a) are a primer pair comprising a forward primer and a reverse primer selected from

Forward primer (base position of SEQ	Reverse Primer (base position of SEQ
ID.NO:1)	ID NO:1)
739-757	1941-1924
925-942	1731-1714
925-942	1347-1330
1165-1182	1731-1714
8646-8663	9908-9891
8906-8923	9468-9451
9150-9167	9754-9737
9976-9996	10827-10807
10113-10130	10484-10467
10931-10949	11824-11796
11821-11844	12945-12924
12042-12059	12447-12430

12258-12275	12698-12681

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Forward primer (base josition of SEQ	Reverse Primer (base position of SEQ
ID N0:2)	ID N0:2)
79-96	861-844
184-201	531-514
310-327	768-751
<u>858-875</u>	2042-2025
1053-1070	1619-1602
1278-1295	1913-1896
2011-2028	2757-2740
2110-2127	2493-2476
2305-2322	2682-2665
2744-2761	4135-4118
2942-2959	3628-3611
5257-5274	6471-6454
5440-5457	5973-5956
5707-5724	6231-6214
13261-13278	13629-13612
13384-13401	13731-13714

- 53. (New) A method according to claim 50 or 51 wherein the hybridised pairs of nucleic acid molecules are detected by the polymerase chain reaction.
- 54. (New) A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:
- (a) contacting a gene of an *E. coli* in the sample with a nucleic acid molecule according to claim 1, in conditions sufficient to allow the nucleic acid molecule to hybridise to the gene; and
- (b) detecting whether the nucleic acid molecule is hybridised to the gene, to detect the H and O serotype of *E. coli* in the sample.

- 55. (New) A method according to claim 50 wherein the gene of an *E. coli* in the sample is contacted with a nucleic acid molecule according to claim 1, and a nucleic acid molecule comprising the nucleotide sequence of any one of SEQ ID NOS: 9, 55, 57 to 65 of a part thereof.
- 56. (New) A method according to claim 40 or 41 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.
- 57. (New) A kit for identifying the H serotype of *E. coli*, the kit comprising a nucleic acid molecule according to claim 32, a primer according to claim 6, or a composition according to claim 3, 4 or 8.
  - 58. (New) A kit for identifying the H and O serotype of *E. coli*, the kit comprising:
  - (a) a nucleic acid molecule according to claim 32; and
  - (b) at least one nucleic acid molecule selected from the group consisting of:

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mbdH (nucleotide position 739 to 1932 of SEQ ID NO: 45),
wzx (nucleotide position 8646 to 9911 of SEQ ID NO: 45),
wzy (nucleotide position 9901 to 10953 of SEQ ID NO: 45),
wbdM (nucleotide position 11821 to 12945 of SEQ ID NO: 45),
wbdN (nucleotide position 79 to 861 of SEQ ID NO: 56),
wbdO (nucleotide position 2011 to 2757 of SEQ ID NO: 56),
wbdP (nucleotide position 5257 to 6471 of SEQ ID NO: 56),
wbdR (nucleotide position 13156 to 13821 of SEQ ID NO: 56),
wzx (nucleotide position 2744 to 4135 of SEQ ID NO: 56) and
wzy (nucleotide position 858 to 2042 of SEQ ID NO: 56).
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59. (New) A kit for identifying the H and O serotype of E. coli, the kit comprising:

- (a) a nucleic acid molecule according to claim 1 and one or more nucleic acid molecules comprising the nucleotide sequence of any one of SEQ ID NO: 1 to 12 or 14 to 44 or 46 to 55 or 57 to 68 or a part thereof; and
  - (b) at least one nucleic acid molecule selected from the group consisting of: wbdH (nucleotide position 739 to 1932 of SEQ ID NO: 45), wzx (nucleotide position 8646 to 9911 of SEQ ID NO: 45), wzy (nucleotide position 9901 to 10953 of SEQ ID NO: 45), wbdM (nucleotide position 11821 to 12945 of SEQ ID NO: 45), wbdN (nucleotide position 79 to 861 of SEQ ID NO: 56), wbdO (nucleotide position 2011 to 2757 of SEQ ID NO: 56), wbdP (nucleotide position 5257 to 6471 of SEQ ID NO: 56), wbdR (nucleotide position 13156 to 13821 of SEQ ID NO: 56), wzx (nucleotide position 2744 to 4135 of SEQ ID NO: 56) and wzy (nucleotide position 858 to 2042 of SEQ ID NO: 56).
- 60. (New) A kit according to claim 59 wherein the composition of (b) comprises a forward primer or a reverse primer selected from the group of

Forward primer (base position of SEQ	Reverse Primer (base position of SEQ
ID_NO:I)	ID N0:1)
739-757	1941-1924
925-942	1731-1714
925-942	1347-1330
1165-1182	1731-1714
8646-8663	9908-9891
8906-8923	9468-9451
9150-9167	9754-9737
9976-9996	10827-10807
10113-10130	10484-10467
10931-10949	11824-11796
11821-11844	12945-12924

12042-12059	12447-12430
12258-12275	12698-12681

Forward primer (base position of SEQ	Reverse Primer (hase position of SEQ
ID N0:2)	ID.NO:2)
<u>79-96</u>	861-844
184-201	531-514
310-327	768-751
858-875	2042-2025
1053-1070	1619-1602
1278-1295	1913-1896
2011-2028	2757-2740
2110-2127	2493-2476
2305-2322	<u>2682-2665</u>
2744-2761	4135-4118
2942-2959	3628-3611
5257-5274	6471-6454
<u>5440-5457</u>	5973-5956
5707-5724	6231-6214
13261-13278	13629-13612
13384-13401	13731-13714

primers shown in the Tables above.

61. (New) A kit according to claim 59 or 60 wherein the composition of (a) comprises a forward primer and a reverse primer selected from the group of

Forward primer (base position of SEQ	Reverse Primer (base position of SEQ
ID N0:1)	ID N0:1)

739-757	1941-1924
925-942	1731-1714
925-942	1347-1330
1165-1182	<u>1731-1714</u>
<u>8646-8663</u>	9908-9891
<u>8906-8923</u>	9468-9451
9150-9167	<u>9754-9737</u>
<u>9976-9996</u>	10827-10807
10113-10130	10484-10467
10931-10949	11824-11796
11821-11844	12945-12924
12042-12059	12447-12430
12258-12275	12698-12681

Forward primer (base position of SEQ	Reverse Primer (base position of SEQ
ID N0:2)	ID N0:2)
79-96	861-844
184-201	531-514
310-327	<u>768-751</u>
858-875	2042-2025
1053-1070	1619-1602
1278-1295	1913-1896
2011-2028	2757-2740
2110-2127	2493-2476
2305-2322	2682-2665
2744-2761	4135-4118
<u>2942-2959</u>	3628-3611
<u>5257-5274</u>	6471-6454
5440-5457	5973-5956
5707-5724	6231-6214
13261-13278	13629-13612
13384-13401	13731-13714

forward and reverse primers shown in the Tables above.

- 62. (New) A method according to claim 43 or 44 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.
- 63. (New) A method according to claim 46 or 47 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.
- 64. (New) A method according to claim 50 or 51 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.
- 65. (New) A method according to claim 54 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.
  - 66. (New) A kit for identifying the H and O serotype of E. coli, the kit comprising:
- (a) at least one primer according to claim 6 or a composition according to claim 39; and
  - (b) at least one nucleic acid molecule selected from the group consisting of: wbdH (nucleotide position 739 to 1932 of SEQ ID NO: 45), wzx (nucleotide position 8646 to 9911 of SEQ ID NO: 45), wzy (nucleotide position 9901 to 10953 of SEQ ID NO: 45), wbdM (nucleotide position 11821 to 12945 of SEQ ID NO: 45), wbdN (nucleotide position 79 to 861 of SEQ ID NO: 56), wbdO (nucleotide position 2011 to 2757 of SEQ ID NO: 56), wbdP (nucleotide position 5257 to 6471 of SEQ ID NO: 56),

wbdR (nucleotide position 13156 to 13821 of SEQ ID NO: 56),

wzx (nucleotide position 2744 to 4135 of SEQ ID NO: 56) and

wzy (nucleotide position 858 to 2042 of SEQ ID NO: 56).

67. (New) A kit for identifying the H serotype of E. coli, the kit comprising a

nucleic acid molecule according to claim 1 and one or more nucleic acid molecules comprising

the nucleotide sequence of any one of SEQ ID NO: 1 to 12, 14 to 44, 46 to 55 or 57 to 68 or a

part thereof.

68. (New) A kit comprising a nucleic acid molecule according to claim 32 and one

or more nucleic acid molecules comprising the nucleotide sequence of any one of SEQ ID NO:

1 to 12 or 14 to 68 or a part thereof.

Respectfully submitted,

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